Small Hands on a Grand Piano: Understanding Individual Differences and Approaches for Small-Handed Pianists

By

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Abstract

Having small hands is often seen as a downside for pianists because the majority of standard repertoire in the Romantic era contain large hand-spanned passages which cause challenges for people with small hands. According to research from the International Journal of Industrial Ergonomics, playing-related musculoskeletal disorders (PRMDs) are often found among musicians, especially pianists. The researchers found that pianists with smaller hands tend to excessively contort their digits in order to play chords and octaves, which leads to a higher risk of developing PRMDs.[1] However, I believe these issues and the pianist's or instructor's ignorance about the physical aspects of piano playing are the cause of PRMDs and not necessarily the size of the hand. It is one's approach to the instrument that causes the injuries which can be prevented by using the correct techniques that are appropriate for one's hand shape. As an educator, having an awareness of student's individual needs is crucial. I would like to provide a balanced perspective on different hand shapes and sizes, and offer practical solutions when working with students with different hands shapes and sizes, especially small ones.

[1] Kuan-Yin Lai et al., "Effects of Hand Span Size and Right-Left Hand Side on the Piano Playing Performances: Exploration of the Potential Risk Factors with Regard to Piano-Related Musculoskeletal Disorders," *International Journal of Industrial Ergonomics* 50 (November 2015): 101.

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Introduction

Since the 1970s the field of critical disability studies has articulated a contrasting viewpoint to the traditional views of what constitutes ability. This view addresses issues related to ability and disability and how they are socially constructed. Instead of seeing disability as a pathology that needs to be fixed or remedied, disability studies views disabilities as limitations brought upon by society and its ideologies and practices that valorize a standard way of looking and being. This view places the responsibility dismissing difference and its failure to accommodate difference, which as a result *disable* individuals. Due to this, disability studies pushed for a different approach in educating students with physical and cognitive differences which embraces diverse approaches in learning and teaching.[2] Like in all fields of education, music education serves a wide variety of students with varying levels of skills, knowledge, ability, and physical dispositions. Music education can benefit from the insights of disability studies by rethinking the ways in which to accommodate students. In applying this concept to piano performance studies, different hand sizes could be embraced and encouraged as viable elements for sustaining a music career and performing successfully.

Students with small hands are often viewed as being at a disadvantage due to their small hands being perceived as a limitation in becoming successful piano players. This view constrains what teachers teach and how they teach students with small hands. Instead of embracing and encouraging students with small hands and accommodating their specific needs, often they are

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[2] David J. Connor, Jan W. Valle, and Chris Hale, *Practicing Disability Studies in Education: Acting Toward Social Change* (New York: Peter Lang Publishing, 2015), vi.

discouraged from pursuing a music career. For instance, as a small person with small hands I was told by a few on my teachers that I would not be a successful pianist. Even though that did not deter me from pursuing music as my career, I believed that having small hands was a deficit, an unalterable limitation that I had to accept as a pianist. I internalized some of these negative comments that distressed me in ways that limited my ability to try a variety of repertoire and improve my skills.

According to TheSmallhandedPianist.com, an online resource center for all pianists, small hands are defined by the following factors: 8 inches or less between expanded fingers 1–5, a 2–5 finger span that is less than 75% of the 1–5 finger span and comfortable octave, but reaching for a 9th on the edge of the white keys.[3] My right hand is 7 inches and my left hand is 7.2 inches which requires a maximum stretch to play an octave. Early in my music education, I had a teacher who was well aware of my hand size. The teacher would carefully select repertoire to fit my hands, avoiding repertoires that had many octaves and large chords which required maximum stretch for my hands. Later in my studies, I had another teacher who intentionally introduced pieces that were challenging for my hands. While in the first instance, the teacher accommodated my needs, in the second instance I was challenged because the instructor tried to teach me application of movements and fingerings that worked for his hand size which was much bigger than mine. I was given little to no support in helping accommodate the challenges due to small hands and when I failed to master the pieces, the deficit was put on me. This experience was both emotionally and physically harmful, where I was often psychologically

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[3] "Welcome!" TheSmallHandedPianist.com – An Online Resource and Reference Center, accessed 2 February 2017, http://www.thesmallhandedpianist.com.

dejected and experienced pain in my arms and hands. This resulted in our interactions being tensed and frustrating, negatively impacting our learning and teaching experiences. These two experiences led me to want to understand how much of my limitations were caused by having small hands, and finding new ways to accommodate my needs so that I can develop an expansive musical repertoire without limiting my possibilities of playing pieces that have many octaves and big chords. Overall, I was curious about alternative approaches to use as a small handed pianists as a learner myself, and perhaps more importantly as a teacher who might have to work with a student with small hands.

As I explored current research, I found several solutions for small-handed pianists such as selecting specific repertoire, using reduced size keyboards, and developing strategies to overcome challenges when using a standard keyboard. All these solutions seemed to suggest that having small hands need not be a limitation if teachers and students are aware of ways in which to accommodate this difference. Furthermore, I would like to explore an area which is generally overlooked, namely, the benefits of having small hands in piano playing and propose a balanced perspective on small-handed pianists. By discussing psychological and physical aspects of pianists (small hands versus large hands), ergonomics in piano playing, approaches and applications for small handed pianists and their teachers. The significance of this project is to highlight the importance of pedagogues recognizing and understanding differences in individual students and developing robust pedagogical knowledge and skills in order to assist pianists with a wide variety of differences.

Chapter 1

Psychological and Physical Aspects of Pianists

Stigma of Small-Handed Pianists

In disability studies, disability is viewed as a socially constructed concept or "as something that is not an intrinsic characteristic of certain bodies but a construct produced through the interaction of those bodies with socially based norms that frame the way those bodies are generally perceived."[4] In relating that to the stigma surrounding small-handed pianists, people might perceive smaller hand size differences as a disability and thus a disadvantage. These perceptions can be linked to the development of keyboard size and types of musical repertoire in the 19th century.

In the early developmental years of keyboard instruments (14th century to 18th century), there were various sizes of keyboards and instruments according to their function. Keyboards were smaller compared to today's standard size. The main determinant in piano manufacturing was to meet the needs of composers and pianists of their time. Especially in the nineteenth century, European composers such as Beethoven, Clementi, Chopin, and Liszt, had strong connections with major manufacturers. The current standard keyboard size which has become the norm in the last century dates back to about 1880.[5] The development included the use of cast

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[4] Carrie Sandahl and Philip Auslander, *Bodies in Commotion: Disability and Performance* (Ann Arbor, MI: University of Michigan Press, 2005), 215.

[5] Rhonda Boyle, "Keyboard Size - Brief History," Alternatively Sized Piano Keyboards, accessed 2 February 2017, http://www.smallpianokeyboards.org/keyboard-history.html.

iron frames, heavier and deeper action, heightened black keys over white keys, increased lengths of the keys, and finally the vertical depth of the keys and key sizes.

Ralph A. Manchester argues that this normalizing of the piano keyboard size is a problem, saying:

> Musical instrument design has evolved over time, and that is part of the problem we now face. In most cases, the designers of those instruments were men (rather than women) who lived and worked a few decades to a few centuries ago, mainly in Europe. They were likely to design instruments that they could use and that would be favored by the majority of musicians back then, who were mostly male. Today, musicians comprise a more diverse group with far more women, relatively few persons of European descent, and more persons with various physical disabilities. Nonetheless, we still play instruments that were designed for a fairly homogenous group of performers.[6]

The belief that one should have long fingers and big hands to become a great pianist is a consequence of the standard size keyboard and repertoire in the Romantic period. During this period, repertoire was created for and by European men who promoted virtuosity in piano playing. For example, Chopin's and Liszt's music often required the ability to play sixths, octaves and large chords which are more challenging for pianists with small hands. As a result, having bigger hands was more advantageous than having smaller ones. Therefore, having small hands came to be seen as an obstacle in becoming a professional pianist. Despite these views, there are numerous famous pianists with small hands such as Maria João Pires (Portuguese Pianist), Alicia de Larrocha y de la Calle (Spanish pianist) and Josef Casimir Hoffmann (Polish-American Pianist), who did not let these misconceptions stop them from pursuing their careers.

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[6] Ralph A. Manchester, "Musical Instrument Ergonomics," *Medical Problems of Performing Artists* 21, no. 4 (2006): 157.

Two Types of Mindsets

In the field of psychology, Carol Dweck has discussed two types of mindsets: entity and incremental. Individuals who endorse the entity theory (fixed mindset) tend to believe that attributes, such as intelligence or moral characters are fixed. Individuals who endorse the incremental theory (growth mindset) tend to believe that attributes are more dynamic, malleable, and can be developed. Research shows how different mindsets react to personal issues such as achievements and setbacks. For example, people with fixed mindsets respond helplessly to negative events, such as showing negative self-judgment, negative affect, a lack of persistence, and performance decrements. In contrast, people with growth mindsets respond in a mastery-oriented manner, characterized by a focus on effort, persistence, and generation of new problem-solving strategies. As a result, one's mindset predicts the way one behaves in learning, how they judge their abilities, react intellectually in both social and moral domains.[7]

These theories help us understand how learning and performing outcomes of pianists with small hands could potentially be determined by their mindset. For example, if a student is struggling with learning pieces and has a teacher who has a fixed mindset about the issue, this may result in blaming the student's ability and seeing them as incapable or untalented. This then leads to the student internalizing these negativities and embracing a fixed mindset that further limits them. Here the real obstacle lies not in their actual ability but in what they believe about their abilities. If they believe that they cannot improve their performance because of their small hands, they may accept that they are limited and give up. In contrast, pianists who position

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[7] Carol S. Dweck, Chi-yue Chiu, and Ying-yi Hong, "Implicit Theories and Their Role in Judgments and Reactions: A Word from Two Perspectives," *Psychological Inquiry* 6, no. 4 (1995): 267–85.

themselves with the growth mindset might explore possibilities and strategies and even master what they initially thought impossible. Pianists with small hands may face certain challenges, but so do pianists of all hand shapes and sizes. Viewing differences as a normal human variation and accommodating difference by embracing a growth mindset might encourage teachers and students to take the route of exploring possibilities and strategies in addressing what may seem like an intractable limitation.

Individual Differences

Otto Ortmann (1889-1979), an American piano pedagogue in his book *Physiological and Mechanics of Piano Technique* (1929), described an experimental study of the nature of the muscular action used in piano playing. There are two chapters of the book in which he discusses the importance of individual differences. One chapter introduces differences in arms, muscle, and strength. The other focuses on differences of the hands, such as natural hand positions, hand types, and styles. He stated the complexity and subtlety of individual differences, such as the size of hands, the length of the fingers and arms, the weight of the arms and range of movements, all of which would affect sound production. His views highlighted an important way in which we can reframe how we understand the physical attributes of pianists. In summary, his research suggests:

> **Arms:** Individual arm weight gives variety in tone production by the force of falling (free fall). The impact of this movement depends on weight and distance from which the arm falls.

Fingers: Differences in finger length and mass also affect the quality of sound. In order to produce equal intensity of finger stroke, lighter fingers require more strength of muscular contraction. The two important factors for finger tips are the amount of cushion beneath the nail and projection of the nail beyond the end of the fingers.

Muscle: Various individual differences in musculature are found in location and strength. The strength in flexion of the fingers, basic movements in piano playing, are other elements which contribute to sound production. Flexion of fingers is used to increase speed which results in more intensity of sound.

Hands: Ortmann mentioned three elements which determine the adaptability of hands to keyboard stretches; length of fingers, width of hands, angle of abduction among all fingers.[8] The difference in hand shapes is formed by bone structure, and flexibility and stiffness are caused by either bone structure or ligaments surrounding the joints.[9]

According to Ortmann, there are six natural hand positions.[10] Therefore, these individual differences in proportions of the hands naturally lead to the various use of hands in piano playing. For example, double-jointedness is caused by a difference curvature of the skeletal joints, creating a much greater range of flexion. It is crucial to recognize these primary

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[8] Abduction is the spreading apart of the fingers through sideway movements at the knuckle joint.

[9] Otto Ortmann, *The Physiological Mechanics of Piano Technique: An Experimental Study of the Nature of Muscular Action as Used in Piano Playing, and of the Effects thereof upon the Piano Key and the Piano Tone* (New York: Da Capo Press, 1981), 299–320.

[10] Ortmann counted and classified the hand-positions of fifty thousand people by observing hands that hang freely from the arm and hold no objects. See Ortmann, *The Physiological Mechanics of Piano Technique*, 314.

anatomical differences and carefully choose fingerings that fit the hand. Ortmann said students rarely use wrong fingering through sheer carelessness. His advice for teachers is to acquaint him or herself with the physiological structure of students' hands. Ortmann's research has contributed to our understanding of physical differences between pianists and the importance of understanding and accommodating these differences.

However, what I find lacking in his research is a consideration of physical transformation based on use over time such as change of finger nail's line and increasing hand stretches. Many pianists such as Seymour Bernstein, Joseff Hoffman and Guy Maier have suggested the use of stretching exercises as well as stretching one's fingers in warm water to increase stretches between fingers, an important factor which determines hand span. However, according to Dr. Jay Bradley, "…once a hand reaches 180 degrees, the only way to expand the range is to lengthen the fingers."[11] Therefore, it is important to increase the ability to stretch between fingers. However, once you reach 180 degrees between fingers 1-5, that is the maximum stretch ability of one's hand.

Table 1, which based on Boyle and Boyle's research shows required hand span for capacity maximum intervals. One must have an active hand span of 7.5 inches (finger 1-5) in order to play a comfortable octave on white keys, which means that people with an active hand span less than 7.5 inches (or 8 inches inactive) will have more difficult time playing an octave.

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[11] Tretip Kamolsiri, "Even a Small Star Shines in the Darkness: Overcoming Challenges Faced by Pianists with Small Hands" (DMA diss., West Virginia University, 2002), 29.

Table 1. Hand span and white key interval calibration.[12]

Approximate threshold - active hand span (1-5)	Capacity to play white key intervals
7.5 inches	Octave: comfortable, 9th: 'on edge'
8.4 inches	9th: comfortable; 10th: 'on edge'
9.3/9.4 inches	10th: comfortable; 11th:'on edge'

Advantages and Disadvantages of Small Hands versus Big Hands

Heinrich Neuhaus, in *The Art of Piano Playing* (1958) stated that:

> Gifted people with small and difficult hands have a better understanding of the nature of the piano and of their "pianistic" body than the large-handed and broad-boned. Because small hands with small stretch have quite obviously make much greater use of wrist, forearm and shoulder; in fact the whole of the "hinterland," than large hands, particularly large hands with a large stretch… In short, they turn their drawbacks into advantages.[13]

As Neuhaus said, there are potential advantages in what seem to be disadvantages. People with smaller hands often involve the use of their arms and body movements to help accommodate their hand size. In contrast, some people with larger hands who seem to have a lesser sense of connection with their arms and body because they think they can use their big hands to play everything. This is a common problem related to piano playing.

Sound production on a piano depends on two basic factors; 1) physical: size of hand, length of the fingers and arm, weight of the arms, and body, 2) movements: finger flexion, free fall, rotations and circular motions. According to Newton's second law of motion, F (force) = M

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[12] Rhonda B. Boyle and Robin G. Boyle, "Hand Size and the Piano Keyboard: Literature Review and a Survey of the Technical and Musical Benefits for Pianists using Reduced-Size Keyboards in North America," *Proceedings of the 9th Australasian Piano Pedagogy Conference "Expanding Musical Thinking"* (July 2009): 5, http://www.appca.com.au/proceedings/2009/part_1/Boyle_Rhonda_Boyle_Robin.pdf.

[13] Pedro De Alcantara, *Indirect Procedures: A Musician's Guide to the Alexander Technique* (New York: Clarendon Press, 1997), 3.

(Mass) x A (Acceleration). When applied to piano playing, giving the same acceleration into the key, a small hand (less mass) will create less force than a big hand and therefore a big hand (more mass) will create a larger force than a small one. However, since each individual physical structure is fixed, different forces can be created by increasing or decreasing the acceleration which are produced by different hand and arm movements. Therefore in order for a small hand and a big hand to create the same force, a smaller hand will need to increase acceleration and a bigger hand will need to decrease acceleration. Other factors which help create a variety of sounds include the surface of finger tips that touch the keys, the positions and involvement of hands, arms and body, and the strength of muscle. In addition to physical size, hand movement is one of many factors that impact sound production. The wrist, arms and body are all important in creating a wide range of sound qualities in piano playing.

Every hand shape and size has its own disadvantages and advantages. The obvious disadvantage in having small hands is that one cannot reach beyond one hand-span. As a result, the limited range can cause challenges when playing passages with octaves, large chords, big leaps and fortissimo sections. Therefore, small handed pianists should approach these passages carefully with the understanding of using healthy techniques to prevent injuries. The strategies for the challenges are discussed in chapter three. In contrast, the advantages of having small hands are found in passages with fast running notes, light touch (soft sound) and playing in small spaces with closed hand position. These examples are more naturally fitted for small hands rather than bigger ones.

On the other hand, people with large hands face a different set of issues. They have more difficulty playing fast running passages, creating soft sound (light touch) and playing in close

spaces. They are more likely to hit wrong notes because of their big fingers and for some they may need more in and out movement when playing in between black and white keys. However, creating bigger, playing octaves and large chords are not usually a problem for them. Even though one's natural hand size and shape will inevitably affect the sound, it is certainly within one's ability to learn how to control one's hands to produce a wider range of sound qualities.

Chapter 2

Ergonomic Approach to Piano Playing

According to research from the *International Journal of Industrial Ergonomics*, playing-related musculoskeletal disorders (PRMDs) are often found among musicians, especially pianists. Their research suggests that pianists with small hands tend to play through pain, neglect discomfort and stretch their hands excessively, and are therefore more frequently exposed to PRMDs.[14] However, I believe that lack of physical awareness and one's approach to the handling of the instrument are equally important causes for PRMDs, rather than the size of the hand.

As I have mentioned earlier, I went through a period when I experienced discomfort and pain in piano playing. I never experienced these sensations until I was with one particular teacher who told me to do things such as slapping fingers (raise each finger as high as possible and slap down to the key as fast as possible), practicing finger legato, holding the notes according to its value in octave position. He also said "stop moving your arms" and "a little pain is good, it is like working out," advice which later caused a lot of tension in my playing. This not only affect me physically but psychologically as well.

At the end of the 19th century, developments in scientific fields, such as the physics of mechanics, anatomy, psychology and neurophysiology have impacted a group of piano pedagogues, which led to further understanding and solving problems related to piano technique. I will discuss three piano pedagogues in particular. Tobias Matthay, Otto Ortmann and Dorothy Taubman were piano pedagogues in the 20th century who were pioneers in this field

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[14] Kuan-Yin Lai et al., "Effects of Hand Span Size and Right-Left Hand Side on the Piano Playing Performances: Exploration of the Potential Risk Factors with Regard to Piano-Related Musculoskeletal Disorders," *International Journal of Industrial Ergonomics* 50 (November 2015): 101.

First, Tobias Augustus Matthay (1858-1945) was an English pianist, teacher, and composer. His beliefs and pedagogical instruction found that (explanation provided by me in italics):

1. Different speeds create different tone qualities and dynamics. *(This corresponds with law of physics.)*
2. It is important to develop a sensitive touch to key resistance (i.e., to develop sensitivity to sound and touch by playing to a key spot rather than a key bed). *(Understanding the mechanics of the instrument, especially the fact that once the key action happens there is nothing one can do on the key to alter the resulting sound. The ability to sense the key spot, the point at which a key level impacts the hammer action to hit the strings, will give a pianist better control over sound production and help prevent common hand injuries caused by key bedding, which occurs when the pressure remains in the key after the note is sounded.)*
3. Forearm rotation, which can be visible or invisible is an important aspect of basic training for finger independence.[15] *(A Common misconception about finger independence is to practice raising individual finger as high as possible and practice playing as loud as possible to develop strength. This way of practice not only isolates the fingers from the rest of the body but also requires using the extreme ranges of finger motion, which is impractical in many musical passages. By using forearm rotation, fingers and arms are integrated to produce motions which is a more natural and*

[15] Marienne Uszler, Stewart Gordon, and Scott Mcbride Smith, *The Well-Tempered Keyboard Teacher*, 2nd ed. (Boston, MA: Schirmer, 2000), 301–5.

efficient movement. It helps support hands and arms alignment close to the natural position.)

Second, Otto Rudolph Ortmann (1889-1979) was an American pianist, music researcher and educator. In his book *The Physiological Mechanics of Piano Technique* in 1929, he deals with the physics of mechanics, physiology (explaining skeletal and muscular location and function of torso, arms hands and fingers), tone color, weight, relaxation and rotation at the keyboard. Ortmann wrote:

> Clear understanding of the physics attending tone production at the piano and the physiological process used in playing piano is the only logics basic from which to arrive at psychological suggestions.[16]

His principle beliefs are:

1. Coordinated movement requires balance between tension and relaxation as well as constant adjustment to the musical passage.
2. Curvilinear movement is preferable to angular movement.
3. Muscular tension and fixation, and not weight transfer, is basic to efficient piano playing (weight transfer is a result of muscular contraction).
4. Use of a high finger action is inefficient and a high wrist makes a high finger stroke difficult.
5. Snapping stroke is useless for strength but can be useful for repeated notes with changing fingers.
6. An arched hand position provides the most efficient base for fingers to move.
7. Using mid-range motions to play everything is the best for each person's hand.

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[16] Uszler, Gordon, and Smith, *The Well-Tempered Keyboard Teacher*, 308.

8. It is important to consider individual physiological differences.

Ortmann concluded that smooth and coordinated movements can be commonly found among technically proficient players, in which a corresponding alteration of coordination (a constant balance between the use of the larger unit-arm- and smaller unit-fingers-) depends on the musical patterns.[17] His principles helped explain the cause of my injury. For example, according to number four and five, use of high finger stroke and snapping stroke are useless for strength and are inefficient and unnatural for the hand, while number six and seven shows that positions that cause one hand to be out of the mid-range and arched positions—in my case, the octave position—are not good for the hand.

Lastly, Dorothy Taubman (1917 - 2013) was an American music teacher, lecturer and founder of the Taubman Institute of Piano (est. 1995), who has a reputation for having a high success rate in helping people recover from playing injuries. Many of her principles were based on the pedagogy of Matthay and Ortmann. She strongly believed in prioritizing physical movements over musical ideas, because only focusing on musical ideas can be harmful if physical movements are not considered carefully. Her principle techniques include:

1. Unification: all body parts work together and properly coordinated.
2. Mid-range of motion: avoid movement to the extreme range of motion.
3. Eliminate unnecessary movement.
4. Alignment: maintain correct alignment of body parts in all conditions.
5. Division of labor: labor should be divided between all the body parts which is most suitable for a passage.

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[17] Uszler, Gordon, and Smith, *The Well-Tempered Keyboard Teacher*, 308–13.

6. Efficient use of instrument: the mechanism of the tool, used within its limits of design and to its utmost effect with a minimum of muscular effort.
7. Minimal muscular effort: decreasing muscular effort overall to minimal levels by using gravity and rotation movement.

Taubman believes that all parts should move in the same direction at the same time while maintaining alignment. The four basic movements are:

1. Forearm rotation: single and double rotation are believed to be the fundamental to all finger techniques.
2. In and out: for adjusting different length of fingers to black and white key.
3. Walking arm: to support individual finger and maintain alignment.
4. Shaping: movement that includes arm weight and weight release "overwave" and "underwave" (combination of the two movements create circular motion).[18]

Many pianists have different opinions on Taubman's technique because of their own experiences and attitudes. Even though she has a very successful reputation for helping people recover from playing related injured, one criticism of her approach is that she focuses too much on the physical aspect of piano playing, consequently neglecting its musical aspect. I think it is important to focus on technical training with variations according to each individual and their condition and this necessarily does not detract from musical aspects of piano playing. People who have developed natural ways of playing may have a more difficult time understanding and explaining physical movements in piano playing or empathize with others who face technical problems. Since I have experienced both, in my opinion, if something works there must be a

[18] Uszler, Gordon, and Smith, *The Well-Tempered Keyboard Teacher*, 334–37.

reason and it is important to be mindful and open-minded about different approaches and techniques, because it can be a useful tool if not for yourself then for others. And If previous training has caused any injury, it is worth reviewing ways to retrain using a basic of healthy technique. This will not only help gain more understanding but also have a long-term benefit on the issue.

In summary, the most helpful technical and physical tools as described above for small-handed pianists include:

1. Avoid pushing into the key bed at all times use rotations for tremolos, trills, broken chords, third and sixth octaves and scales.
2. Maintain alignment of hands and arms; avoid twisting and unnecessary finger stretches.
3. Use the mid-range of motions; avoid repeating extreme motions without resting.
4. Avoid fixed and rigid hand positions, such as suspending uninvolved fingers above the keys.
5. Choose fingering that naturally fits one's hand shape best, considering piano topography and different finger lengths, using whatever best expresses the musical idea.

To conclude, Anyone is capable of learning and teaching, it is important for teacher to understand ergonomic in piano playing and develop a observing skill to student's respond as well as finding different way to explain an idea. As important as musical ideas are, understanding the physical mechanics of instruments as well as the basic physical factors involved in sound production is extremely crucial. Understanding ergonomic piano playing not only helps prevent

damage but also increases the pianist's maximum potential for piano playing regardless of hand shape and size.

Chapter 3

Approaches for Small-Handed Pianists

By applying a growth mindset and considering the social constructions of disability I examine solutions and strategies to overcome obstacles. I will provide three different approaches in dealing with small-handed pianists.

1. Selecting Repertoire

Challenges for pianists with small hands have increased with the development of the instrument and the musical style during the Romantic period with its tendency to use thicker textures, more notes in chords to create a bigger sound, and a wider range in melody and dynamics. In contrast, repertoire from the Baroque and Classical periods—with their lighter textures—are not usually a problem for small hands. There is a lot of repertoire from which pianists can choose, and some were composed specifically for small-handed pianists. When choosing repertoire, consider one's hand capacity. Be mindful of required technique in a given work and one's technical capability, and choose repertoire that are comfortable for one's hands. Also, avoid pieces that constantly require the hand to be stretched, such as octaves and big chords. However, keep in mind that some techniques will never develop or improve if you avoid repertoire requiring those techniques. It is important to work on some challenging techniques because there will always be some improvement if you work on it carefully and consistently.

2. Use a Reduced Sized Keyboard

Different keyboard sizes provide options for people with diverse hand sizes. By using the appropriate keyboard size for one's hand, passages which would normally feel uncomfortable or impossible on the standard keyboard will become comfortable and possible on a smaller keyboard size. The origin of this idea began with Josef Hoffmann, a renowned pianist who had a custom-made keyboard built by Steinway in the 1920s in order to accommodate his small hand size. In 1991, David Steinbuhler met Christopher Donison, a music festival director who had a 7/8 keyboard—an octave on his keyboard was equal to a 7th on the conventional keyboard—installed in his concert grand piano in the late 1970s which sparked his idea of producing a new keyboard size later named DS standard (Donison-Steinbuhler). The first keyboard was successfully build in 1994 and was installed in his mother's piano. In 1996, the first keyboard was sold to Linda Gould for her Yamaha grand piano.[19] Currently, there are three more options added to the Conventional keyboard which are DS6.0, DS5.5 and DS5.1. The following are details about each keyboard size:

1. DS6.5™ (Conventional keyboard) – 6.5 inch (16.5 cm) octave, 48.29 inches (122.7 cm) total width.
2. DS6.0® (Universal keyboard, 15/16 width of conventional – 6.0 inch (15.2 cm) octave, 44.57 inches (113.2 cm) total width.
3. DS5.5® (7/8 keyboard, 5.54 inch (14.1 cm) octave, 41.14 inches (104.5 cm) total width.

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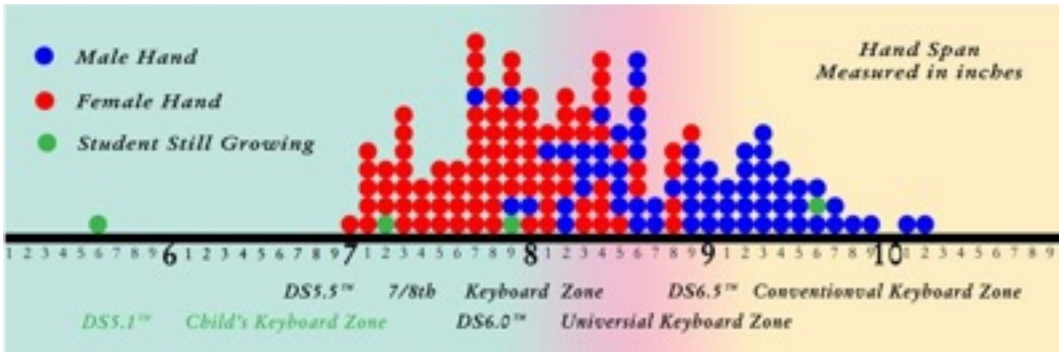
[19] David Steinbuhler, "Our Story," Donison-Steinbuler Standard - Power, Ease, Artisty: Within your Reach, accessed 9 March 2017, www.steinbuhler.com.

4. DS5.1™ (Child's keyboard, 5.11 inch (13.0 cm) octave, 37.94 inches (96.37 mm) total width.[20]

The keyboard and its actions were designed to replace a conventional keyboard in a grand piano. Figure 1 shows average female and male hand sizes with suggested different keyboard size options.

Figure 1. Pianists' hand spans measured at the MTNA Convention in 2004 with suggested different keyboard sizes.[21]



When considering this option, one might consider the practicality of adjusting to different keyboard sizes. According to research on *Hand Size and the Piano Keyboard: Literature Review and a Survey of the Technical and Musical Benefits for Pianists using Reduced-Size Keyboards in North America* by Rhonda B. Boyle and Robin G. Boyle from Deakin University, there are many benefits for pianists with small hands when using reduced-size keyboards. However, results indicated an initial drop in performance quality when moving from the conventional

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[20] Rhonda Boyle, "Keyboard Size – Brief History," Alternatively Sized Piano Keyboards, accessed 31 May 2017, http://www.smallpianokeyboards.org/keyboard-history.html.

[21] David Steinbuhler, "Our Research," Donison-Steinbuler Standard - Power, Ease, Artisty: Within your Reach, accessed 9 March 2017, www.steinbuhler.com.

keyboard straight to the 7/8. Four of the five pianists agreed that initial adaptation was as hard as they expected, but also agreed that after a little practice, adaptability was easier than expected.[22] The popularity of reduced-size keyboards is increasing because of support from university research and their usage in some universities and competitions. This effort to accommodate individual needs can eventually change the socially constructed stigmas about small handed pianists.

3. Strategies from Pedagogues for Small-Handed Pianists.

Ortmann said some repertoire can be problematic regardless of one's physical differences. He emphasized the importance of being aware of different of hand sizes, especially for small ones in terms of handling various repertoire. For example, there are two hand positions when small hands play octaves; one is playing at the edge of the white key and the other involves a high wrist position that increases the distance between fingers 1-5.[23]

His suggestions for small hands include:

1. Choose fingerings which fit one's hand best.
2. Divide between hands.
3. Use the thumb for two adjacent white or black keys to avoid twisting of the hand.

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[22] Rhonda Boyle and Robin G. Boyle, "Hand Size and the Piano Keyboard: Literature Review of the Technical and Musical Benefits for Pianists using Reduced-Size Keyboards in North America," *Proceedings of the 9th Australasian Piano Pedagogy Conference "Expanding Musical Thinking"* (July 2009): 9, http://www.appca.com.au/proceedings/2009/part_1/Boyle_Rhonda_Boyle_Robin.pdf.

[23] Otto Ortmann, *The Physiological Mechanics of Piano Technique: An Experimental Study of the Nature of Muscular Action as Used in Piano Playing, and of the Effects thereof upon the Piano Key and the Piano Tone* (New York: Da Capo Press, 1981), 313.

Taubmann's advice for small hands when playing octaves included letting the keyboard open up the hand for an octave at the time of contact, using hand and arm fall with a slight plucking action at the finger tips, using rebound motion, and using fingers 1 and 5 for all octaves passages.[24]

In 1982, Patricia Eger categorized five performance techniques for small hands pianists in her dissertation.[25] Three of them deal with physical applications and two of them with musical applications.

The physical devices are the following:

1. Increase strength and tone for those with small or fragile hand structure.
2. Increase or give the illusion of increasing the hand span.
3. Maintain a small and relaxed hand position.

The musical devices are:

1. Redivisions: redistributions and rearrangements of notes between the hands to reduce stretch requirements.
2. Rewriting: editing or revising of the original text to bring out suitable musical ideas.

Lora Deahl and Brenda Wristen have offered very practical strategies for teaching small-handed students in "Strategies for small handed pianists" (2003).[26] They give practical solutions for

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[24] David Szabo, "Choreography of the Hands: The Work of Dorothy Taubman," YouTube, published 5 March 2015, https://www.youtube.com/watch?v=47w_6IKHA1M.

[25] Tretip Kamolsiri, "Even a Small Star Shines in the Darkness: Overcoming Challenges Faced by Pianists with Small Hands" (DMA diss., West Virginia University, 2002), 3–4.

[26] Lora Deahl and Brenda Wristen, "Strategies for Small-Handed Pianists," *American Music Teacher* 52 (June 2003): 21–25.

problems that small handed students often face, which are legato, octaves, large chords, arpeggios, and also choice of fingering.

Strategies for producing a healthy legato:

1. Match the sound instead of using finger legato (keep hand alignments).
2. Use pedals to connect the sound for widely spaced notes.
3. Passages where two voices are placed in one hand, releasing inner or less important voices early to relieve hand stretches.

Strategies for producing a healthy fortissimo:

1. Increase key speed through free fall and rotation.
2. Use dynamic fluctuations within long fortissimo passages to allow for muscle recovery.
3. Adjust fingering to strong fingers.
4. Maximize the bass through longer pedals to increase the overall dynamic level.

Strategies for playing octaves, large chords and arpeggios:

1. Voice to one side of an octave or one note in a chord and release non-favored notes immediately after playing to relieve hand stretches.
2. Use a rebound motion for octave scales or chains of chords and rest between a succession of chords.
3. Use the sostenuto pedal to sustain notes when appropriate, omit notes or rewrite chords.
4. Long fortissimo octave passages can be redistributed between the hands.

Strategies for fingering:

1. Be aware of individual differences in hand shape.
2. Use fingerings to fit the demands of the music; for example, use the thumb in passages that require maximum power.
3. Re-finger to minimize hand stretches when appropriate; fingerings can be broken into smaller units even if they necessitate more frequent shifts.

This third approach provides ways for pianists with small hands to handle challenging repertoire with caution. Some of these ideas such as awareness of individual differences in hand shape and sizes, keep hand arms and fingers in good alignments, avoiding reaching with fingers or fixed stretched hand position and keeping hands in compact positions when possible to allow for muscle recovery are recommended for all pianists. One might not face problems that pianists with small hands does; however, as a pedagogue, it is important to understand and assist students with different hand sizes and problems. To conclude this chapter, there are three general strategies on how one can choose to handle the subject of small-handed pianists: select repertoire, use reduced sized keyboards, and finding strategies to overcome the challenges.

Chapter 4

Application to two selected Chopin etudes

In this chapter, I will apply the strategies for small-handed pianists discussed in previous chapters to two selected etudes; one is more accessible and the other is more challenging.

First, Chopin's Etude Op. 25 No. 2 in F minor, marked presto, molto legato and piano, contains fast running passages in the right hand and broken chords passages with leaps in the left hand. This piece requires a light touch with a fast tempo, which is naturally difficult to play. However, it is an advantage for people with small hands and skinny fingers—as opposed to big and thick fingers—to play this piece, because it is natural for small hands to play rapid passages with a light touch in a closed hand position. Things to consider are fingering, applied movements and how to practice.

First, it is important to find the right fingering for one's hand especially for very fast runs in the right handed passages because it will help create a smooth legato sound. By considering the topography of black and white keys and its correspondence to finger lengths, it is suggested that longer fingers should be on the black keys and shorter fingers on the white keys. This helps eliminate unnecessary in and out movements.

For L.H. passages use rotation movement for leaps and listen carefully to match the sound. L.H. passages use a combination of movements: a leap of a 10th uses fingers 5 and 1 together with rotation, avoid reaching with fingers (see figure 2). Figure 3, for the downward arpeggio use finger 1-3-5 and apply walking arms motion to keep hand and arm alignment. When these two motions are combined (see figures 2 and 3), they will together create small

circular motions. Practice in slow motion with rotation and increase tempo by playing small groups at a fast tempo, for example, from the first beat in one measure to the next measure. For bigger leaps and crescendos, practice with bigger rotation movements.

Figure 2. Chopin, Etude Op. 25 No. 2, mm. 1–3, L.H. leaps up a 10th using fingers 5-1.

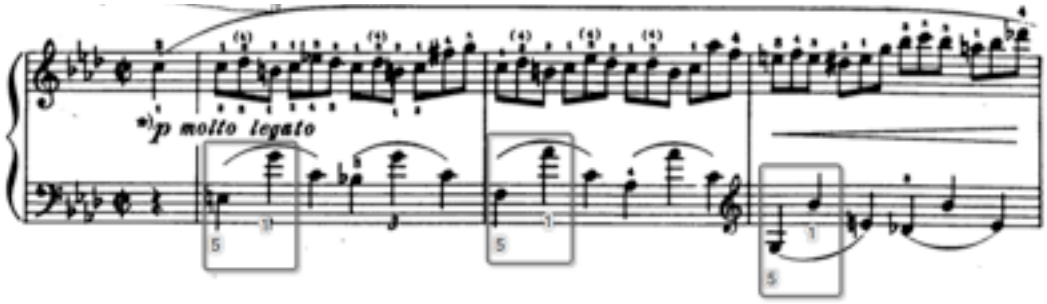
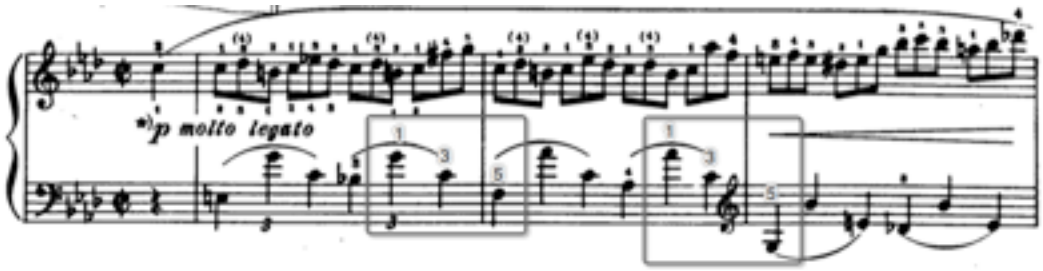


Figure 3. Chopin, Etude Op. 25 No. 2, mm. 1–3, L.H. arpeggiated downward using finger 1-3-5.

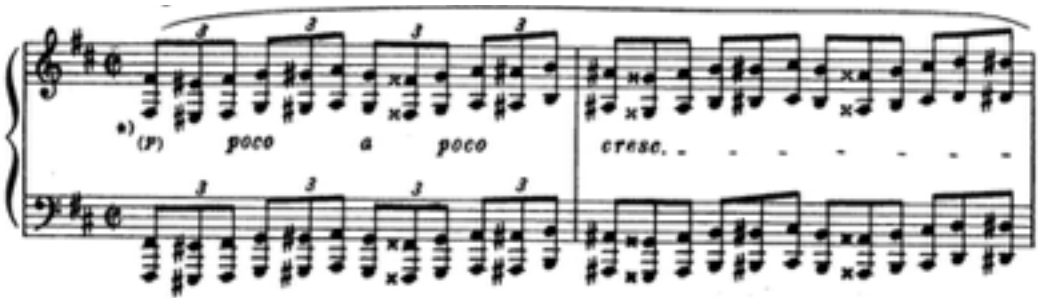


Second, Chopin's Etude Op. 25 No. 10 in B minor, known as the Octaves etude, marked *Allegro con fuoco*, in ternary form ABA'. The A section has parallel octaves with a large dynamic range and it contrasts with a slow lyrical melodies in the B section. This piece is challenging for most pianists but even more so for pianists with small hands because of its consecutive octaves, stretches and large dynamics range from *p* to *fff*. Techniques required for this piece include rapid octaves, big chords, octaves with inner voices, large dynamic ranges, slow singing legato octaves, contrasting sound and endurance for the piece.

The challenging passages for small-handed pianists are those with octaves and chords marked *fff* which require stretched hands. The breaking of chords because the range is too wide which can be compensated by the use of the sustaining a pedal to hold the bass notes in which the hand cannot reach. It is worth briefly digressing here to point out that some passages are easier for smaller hands, such as, playing double 3rd passages because it requires less movement for the hand and easier to control. In contrast, someone with big hands and fat fingers will have a more challenging time playing double third passages, if fingers are too big to fit in between the two-black key. The following are examples of applied ideas:

1. Playing Octaves: using fingers 1 and 5 for good alignment, hands should be in compact position before and right after playing an octave. Rotate toward the thumb and use a rebound motion to prepare for the next notes. There should be a constant motion in the hands, and fixed hand positions should be avoided (see figure 4).

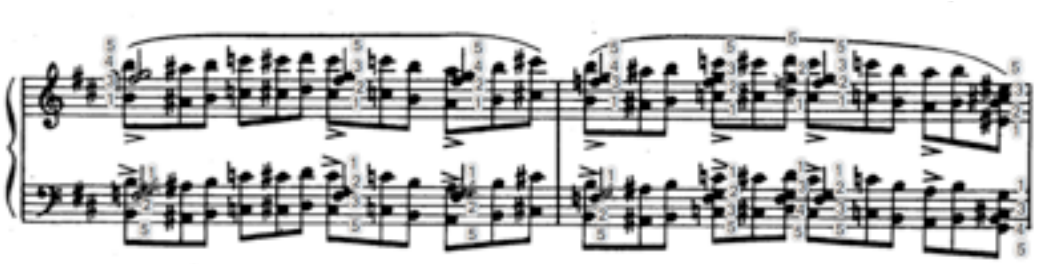
Figure 4. Chopin, Etude Op. 25 No. 10, mm. 1–2.



2. Choose fingering for chords: use the fingers that keep hands in the best aligned position (which depends on one's hand shape and size), avoid twisting fingers and

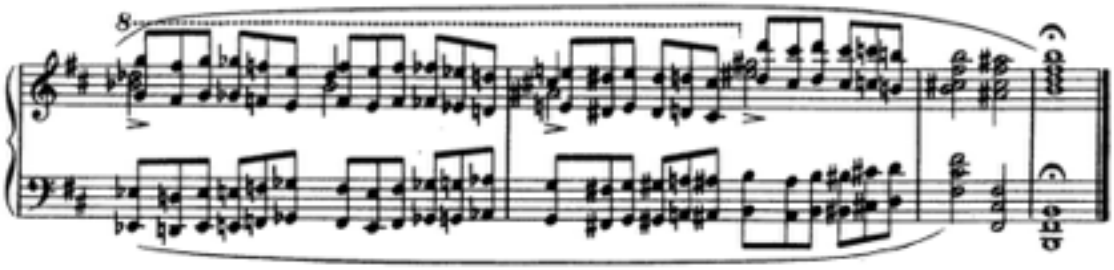
hands, and eliminate some notes if necessary. I have provided my own fingering in figure 5.

Figure 5. Chopin, Etude Op. 25 No. 10, mm. 17–18.



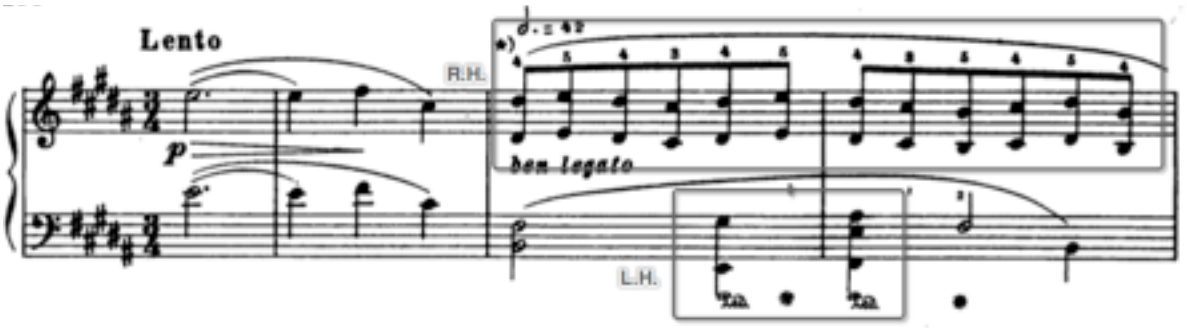
3. Creating a big sound: increase descent speed by using rotation and free fall motions with a little plucking with the fingers. When playing chords, some fingers should be released right after playing the chords, usually the thumbs, (see figure 6).

Figure 6. Chopin, Etude Op. 25 No. 10, mm. 116–119.



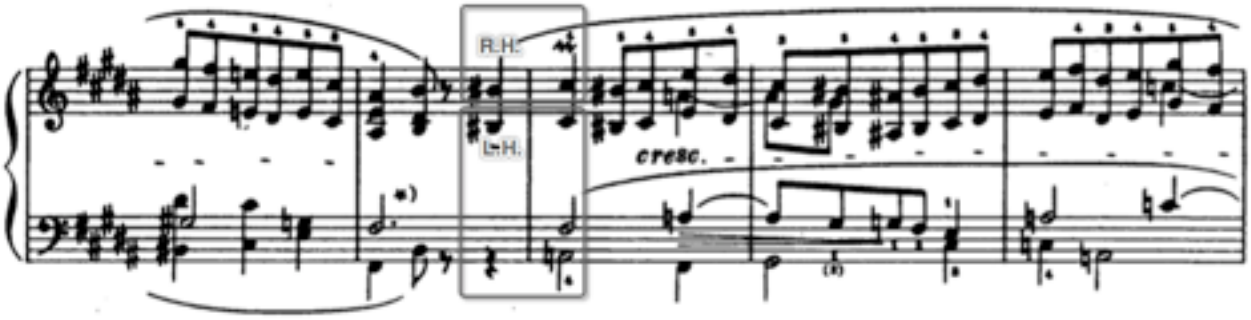
4. Playing octaves legato: match the sounds especially between black keys and white keys by playing one voice at a time. When playing both voices, release the hand from the octave position in between each octave (see figure 7 R.H.).
5. Breaking of chords: use the damper pedal to sustain the bass line (see figure 7 L.H.).

Figure 7. Chopin, Etude Op. 25 No. 10, mm. 31–32.



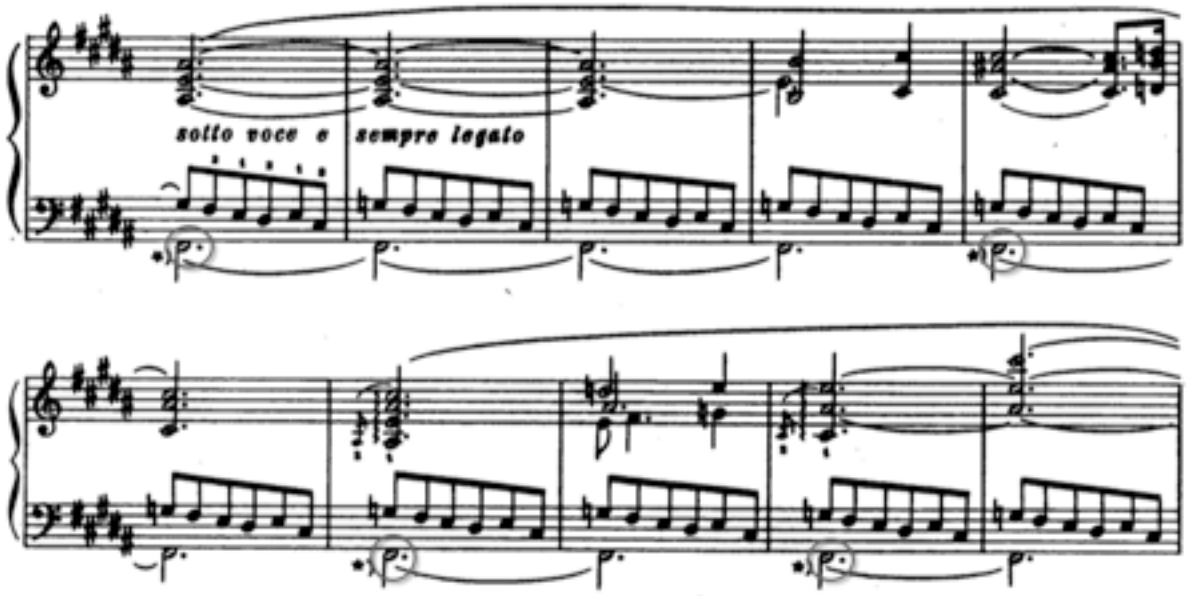
6. Redivision notes between hands: redistribute notes in passages that are impossible to play with one hand or passages that will better express musical ideas after the rearrangement. In figure 8. use the L.H. to play the lower note of the octaves and the R.H. to play the top voice with the mordent for a better melodic line.

Figure 8. Chopin, Etude Op. 25 No. 10 mm. 50–51.



7. Use the sustain pedal to help hold notes that lie beyond the span of the hand (see figure 9).

Figure 9. Chopin, Etude Op. 25 No. 10, mm. 90–99.



In conclusion, I would like to encourage pianists and pedagogues to be aware of individual differences when teaching, select balanced repertoire aimed at developing one's strengths and weaknesses as a pianist, be observant of one's own physical needs, and be creative when finding solutions.

Conclusion

We now live in a world which is much more diverse where life is constantly changing. Learning to understand individuals and live with the differences is crucial. Socially constructed limitations often change over time. Therefore, one should not be discouraged by socially constructed ideas such as physical limitations, gender roles, and personalities; rather we should be encouraged to find individual solutions to achieve one's goals. Knowledge and understanding of the piano's mechanics and the physical aspects of playing cannot be ignored. The application of healthy technique can be taught and learned by anyone. This does not only help prevent injures but also provides the most efficient and effective way in piano playing. Good pedagogues not only acquire the knowledge in their fields but also have the ability to recognize each student's particular differences and are able to guide them to be the best that they can. Affirming her belief in personal effort, Malwine Brée, Leschetizky's student, described the pianist's hands as follows: "Each has its own advantages…an intelligent and faithful practice could turn an imperfect hand to a real-piano hand."[27]

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[27] Tretip Kamolsiri, "Even a Small Star Shines in the Darkness: Overcoming Challenges Faced by Pianists with Small Hands" (DMA diss., West Virginia University, 2002), 9.

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